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REMARKS

Claims 1-20 are in the case. Claims 1, 3-9, 11-16, and 18-20 are rejected under 35 USC § 102 over USPN 6,185,707 to Smith et al. Claims 2, 10, and 17 are rejected under 35 USC § 103 over Smith et al. in view of USPN 6,542,830 to Mizuno et al. Independent claims 1, 9, and 16 have been amended and claims 12-14 and 19-20 are hereby cancelled. No new matter has been introduced by the amendments, which are supported by the disclosure of the original claims and the specification. Reconsideration and allowance of the claims are respectfully requested.

The applicants note with appreciation that the format used by the examiner for the office action was extremely clear and easy to follow.

PRELIMINARY COMMENTS ON REJECTIONS

Three different kinds of information are described between the present claims and the cited references, which are (1) design information, (2) defect information, and (3) failure information. Design information is used as the pattern to construct the integrated circuit. It appears to be well understood by all parties in the present prosecution.

Defect information is generated by performing an "inspection" of the substrate on which the integrated circuits are formed. "Defects" are physical anomalies that can be "seen," such as by an optical method or an electron microscope, for example. Smith et al. refer to this as "production monitoring" that is performed using in-line "inspection equipment." Test information, on the other hand, is not detected with an inspection, rather it is determined by "testing" the operation of the integrated circuit, or relevant portion thereof, with an electrical test. Smith et al. refer to this as "production testing" that is performed using end-of-line "testing equipment."

Thus, there is a difference between "defects" and "failures," and between "inspection" and "testing." While it is acknowledged that these terms as used outside of the field of relevant art may be somewhat synonymous, they have these specific meanings within the field of art. One must be careful, however, because sometimes these terms are used generically even within the field of art, rather than as terms of art. However, in the cited references and in the present application, they are generally

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consisted used as terms of art. Stated another way, "defects" are physical anomalies and "failures" are electrical anomalies; "inspection" looks for the physical anomalies and "testing" looks for the functional anomalies.

Applicants have amended the claims in certain locations to underscore these terms of art, such as by referring to "physical defects." Although "defects" are, in the art, physical by definition, the amendments are an attempt to make this concept impossible to misunderstand.

With the terms of art now clarified, the differences between Smith et al. and the present claims are more readily appreciated. Smith et al. are primarily concerned with locating the sources of failures, meaning electrical anomalies. The failures may be caused by defects (physical anomalies) or by design flaws. Thus, Smith et al. correlate electrical test data with two other types of data (called bitmapping by Smith et al.) in order to determine the sources of those failures. The first type of data is defect data, generated by inspection. The second type of data is design data, generated by SPICE logs or otherwise.

The problem addressed by Smith et al. is that they want to do this analysis on logic devices, for which it is very difficult to determine location data for the failure data generated by electrical testing of a logic device. Both the defect data and the design data have readily available location data, but the failure data does not. Smith et al. propose a method for generating location data for the failure data, so that the failure data can be correlated to the defect data, and the failure date can also be correlated to the design data, and the failure can then be attributed to one or more of a defect or a design problem.

By contrast, the present invention as claimed is directed toward correlating design data with defect data. The present invention as claimed does not really care whether a defect causes a failure, such as can be measured at final test. The basic premise is that different classes of structures in a design are more prone to incurring defects through processing. Thus, there is a desire to determine which classes of structures are so effected, so that the design of the integrated circuit can be changed, thus reducing defects.

Thus, the present invention as claimed compares design data to defect data. This is not ever done by Smith et al. Rather, Smith et al. separately compare design data to failure data, and defect data to failure data, but do not ever compare the design data to the

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defect data — because they only care about the cause of failures, and not about the cause of defects.

With this understood, the differences between Smith et al. and the present invention as claimed is readily understood, as described below in the requisite detail.

CLAIM REJECTIONS UNDER §102

Claims 1, 3-9, 11-16, and 18-20 are rejected Smith et al. Independent claim 1 claims, *inter alia*, a method for producing yield enhancement data by *comparing* a database of *physical defects* to a database of *design information*, and associating the defects with *classes of design information* by location on the substrate of both the defects and elements of the design information.

Smith et al. do not describe such a method. As mentioned above, Smith et al. compare design data to failure data, and defect data to failure data, but do not compare design data to defect data. Further Smith et al. do not bin the design data into classes of design information for their analysis.

Thus, claim 1 patentably defines over Smith et al. Reconsideration and allowance of claim 1 are respectfully requested. Dependent claims 3-8 depend from independent claim 1, and contain additional important aspects of the invention. Therefore, dependent claims 3-8 patentably define over Smith et al. Reconsideration and allowance of dependent claims 3-8 are respectfully requested.

Independent claim 9 claims, *inter alia*, a method for producing yield enhancement data by creating a database of design information including structure location information for physical structures, binning the structures to at least one class of physical structures, creating a database of physical defects associated with defect location information, *comparing the design information with the defects* to create associations between the design information and the defects based on matching the structure location information with the defect location information, and *reporting the defects based on the classes* of the design information with which they are associated.

Smith et al. do not describe such a method. As mentioned above, Smith et al. compare design data to failure data, and defect data to failure data, but do not compare

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design data to defect data. Further Smith et al. do not bin the design data into classes of design information for their analysis.

Thus, claim 9 patentably defines over Smith et al. Reconsideration and allowance of claim 9 are respectfully requested. Dependent claims 11 and 15 depend from independent claim 9, and contain additional important aspects of the invention. Therefore, dependent claims 11 and 15 patentably define over Smith et al. Reconsideration and allowance of dependent claims 11 and 15 are respectfully requested. Dependent claims 12-14 have been canceled.

Independent claim 16 claims, *inter alia*, a computerized system for analyzing defects, including means for receiving design information including structure location information for physical structures, means for binning the structures to at least one class of physical structures, means for receiving physical defect information that contains locations of defects, means for *comparing the design information with the defect information* based on matching the structure location information with the locations of defects, and means for *associating the defects with the classes* of the design information based on physical proximity on the substrate.

Smith et al. do not describe such a method. As mentioned above, Smith et al. compare design data to failure data, and defect data to failure data, but do not compare design data to defect data. Further Smith et al. do not bin the design data into classes of design information for their analysis.

Thus, claim 16 patentably defines over Smith et al. Reconsideration and allowance of claim 16 are respectfully requested. Dependent claim 18 depends from independent claim 16, and contains additional important aspects of the invention. Therefore, dependent claim 18 patentably defines over Smith et al. Reconsideration and allowance of dependent claim 18 are respectfully requested. Dependent claims 19-20 have been canceled.

CLAIM REJECTIONS UNDER §103

Claims 2, 10, and 17 are rejected over Smith et al. in view of Mizuno et al. Dependent claim 2 depends from independent claim 1, and therefore claims *inter alia*, a method for producing yield enhancement data by comparing a database of physical

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defects to a database of design information, and associating the defects with classes of design information by location on the substrate of both the defects and elements of the design information.

The deficiencies of Smith et al. in regard to this combination of limitation are described above. Mizuno et al. do not compensate for the deficiencies of Smith et al., in that Mizuno et al. also do not describe comparing design data to defect data. Further, Mizuno et al. do not bin the design data into classes of design information for their analysis. Thus, claim 2 patentably defines over Smith et al. in view of Mizuno et al. Reconsideration and allowance of claim 2 are respectfully requested.

Dependent claim 10 depends from independent claim 9, and therefore claims *inter alia*, a method for producing yield enhancement data by creating a database of design information including structure location information for physical structures, binning the structures to at least one class of physical structures, creating a database of physical defects associated with defect location information, comparing the design information with the defects to create associations between the design information and the defects based on matching the structure location information with the defect location information, and reporting the defects based on the classes of the design information with which they are associated.

The deficiencies of Smith et al. in regard to this combination of limitation are described above. Mizuno et al. do not compensate for the deficiencies of Smith et al., in that Mizuno et al. also do not describe comparing design data to defect data. Further, Mizuno et al. do not bin the design data into classes of design information for their analysis. Thus, claim 10 patentably defines over Smith et al. in view of Mizuno et al. Reconsideration and allowance of claim 10 are respectfully requested.

Dependent claim 17 depends from independent claim 16, and therefore claims *inter alia*, a computerized system for analyzing defects, including means for receiving design information including structure location information for physical structures, means for binning the structures to at least one class of physical structures, means for receiving physical defect information that contains locations of defects, means for comparing the design information with the defect information based on matching the structure location

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information with the locations of defects, and means for associating the defects with the classes of the design information based on physical proximity on the substrate.

The deficiencies of Smith et al. in regard to this combination of limitation are described above. Mizuno et al. do not compensate for the deficiencies of Smith et al., in that Mizuno et al. also do not describe comparing design data to defect data. Further, Mizuno et al. do not bin the design data into classes of design information for their analysis. Thus, claim 17 patentably defines over Smith et al. in view of Mizuno et al. Reconsideration and allowance of claim 17 are respectfully requested.

CONCLUSION

Applicants assert that the claims of the present application patentably define over the prior art made of record and not relied upon for the same reasons as given above. Applicants respectfully submit that a full and complete response to the office action is provided herein, and that the application is now fully in condition for allowance. Action in accordance therewith is respectfully requested.

In the event this response is not timely filed, applicants hereby petition for the appropriate extension of time and request that the fee for the extension be charged to deposit account 12-2355. If other fees are required by this amendment, such as fees for additional claims, such fees may be charged to deposit account 12-2252.

Sincerely,

LUEDEKA, NEELY & GRAHAM, P.C.

By:

Rick Barnes, 39,596

_____2005.10.27_____